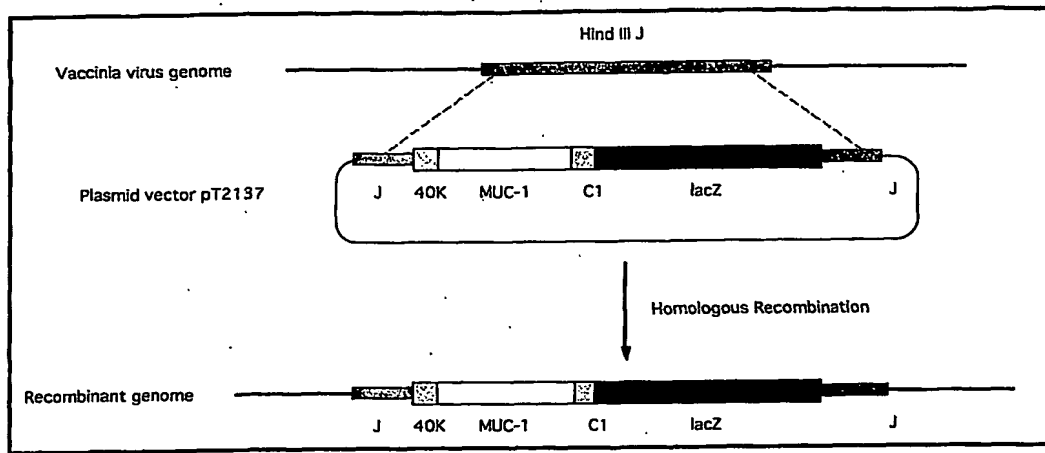
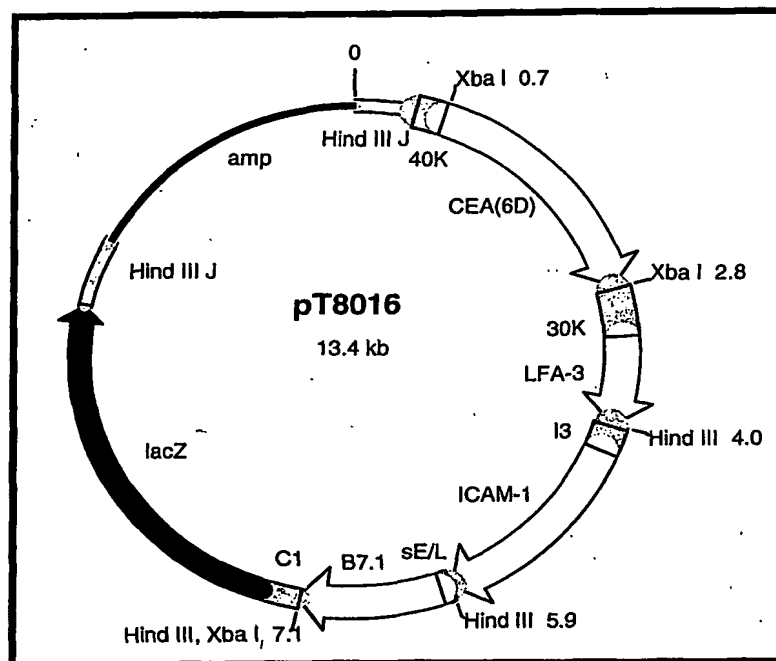


**Figure 1**

**Restriction Endonuclease Map of Plasmid pT2137**

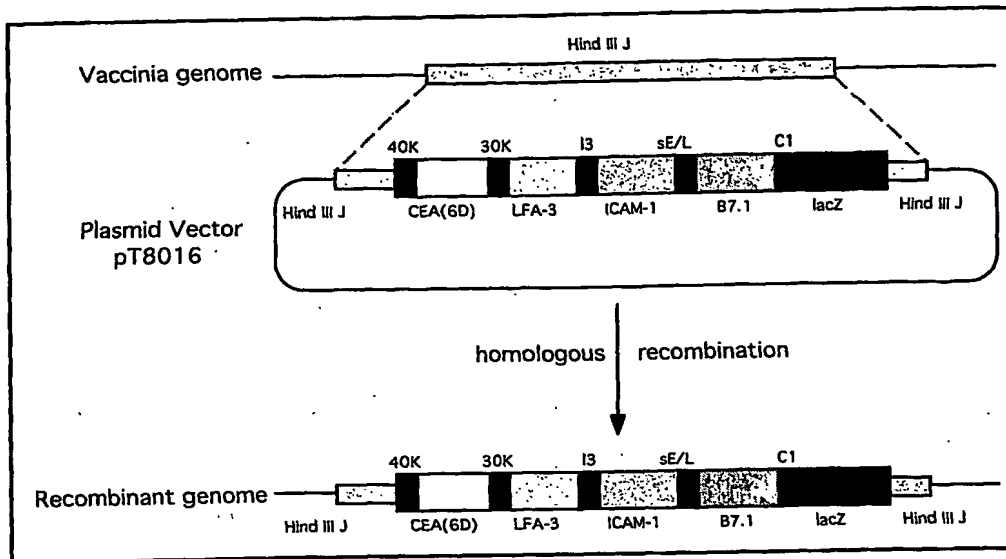


**Figure 2**  
**rV-MUC-1 Vector Schematic**



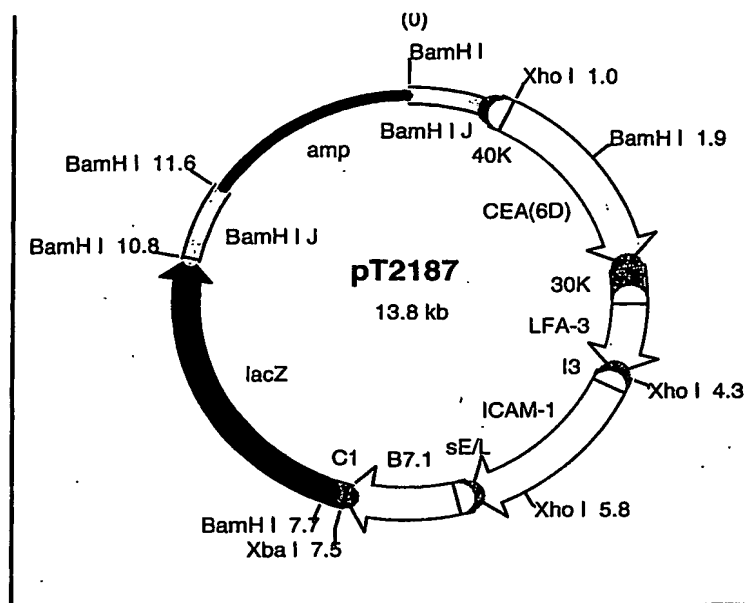
**Figure 3**

**Restriction Endonuclease Map of Plasmid pT8016**



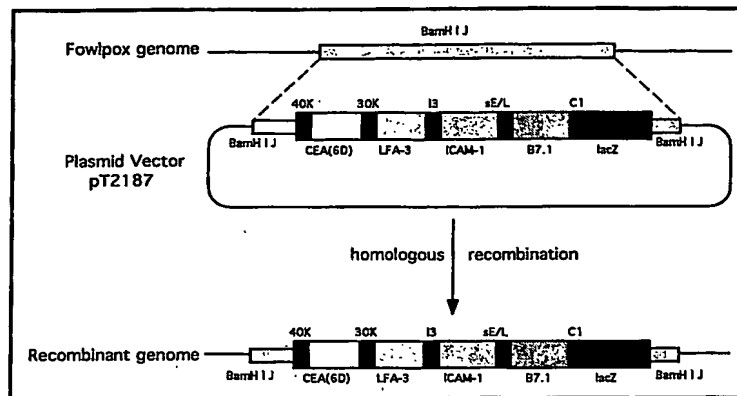
**Figure 4**

**Generation of rV-CEA(6D)/TRICOM Recombinant Vaccinia Virus**



**Figure 5**

**Restriction Endonuclease Map of Plasmid pT2187**



**Figure 6**

**Generation of rF-CEA(6D)/TRICOM Recombinant Fowlpox Virus**

```

1  ATGACACCGG GCACCCAGTC TCCTTTCTTC CTGCTGCTGC TCCTCACAGT GCTTACAGTT
61 GTTACGGGTT CTGGTCATGC AAGCTCTACC CCAGGTGGAG AAAAGGAGAC TTCGGCTACC
121 CAGAGAAGTT CAGTGCCCAG CTCTACTGAG AAGAATGCTG TGAGTATGAC AAGCTCCGTA
181 CTCTCCAGCC ACAGCCCCGG TTCAGGCTCC TCCACCACTC AGGGACAGGA TGTCACCTCG
241 GCCCCGGCCA CGGAACCAGC TTCAGGTTCA GCTGCCTTGT GGGGACAGGA TGTCACCTCG
301 GTACCACTTA CTAGACCAGC TTTAGGTAGC ACAGCACCTC CTGCTCATGG AGTAACTAGT
361 GCTCCTGATA CTCGTCCAGC TCCTGGCAGT ACTGCACCAC CGGCACATGG CGTAACATCA
421 GCACCTGATA CAAGACCTGC ACCTGGATCT ACAGCGCCGC CTGCGCACGG AGTGACATCG
481 GCGCCCGATA CGCGCCCCGC TCCCGGTAGC ACCGCACCGC CCGCCCACGG TGTTACAAGT
541 GCACCCGATA CCCGGCCGGC ACCCGGAAGT ACCGCTCCAC CTGCACACGG GGTCAACAAGC
601 GCGCCAGACA CTCGACCTGC GCCAGGTCG ACTGCCCTC CGGCGCATGG TGTGACCTCA
661 GCTCCTGACA CAAGGCCAGC CCCAGCTAGC ACTCTGGTGC ACAACGGCAC CTCTGCCAGG
721 GCTACCACAA CCCAGCCAG CAAGAGCACT CCATTCTCAA TTCCCAGCCA CCACTCTGAT
781 ACTCCTACCA CCCTTGCCAG CCATAGCACC AAGACTGATG CCAGTAGCAC TCACCATAGC
841 ACGGTACCTC CTCTCACCTC CTCCAATCAC AGCACTTCTC CCCAGTTGTC TACTGGGGTC
901 TCTTTCTTTT TCCTGTCTTT TCACATTTCA AACCTCCAGT TTAATTCTC TCTGGAAGAT
961 CCCAGCACCG ACTACTACCA AGAGCTGCAG AGAGACATTT CTGAAATGTT TTTGCAGATT
1021 TATAACAAG GGGGTTTCTT GGGCTCTCC AATATTAAGT TCAGGCCAGG ATCTGTGGTG
1081 GTACAATTGA CTCTGGCCTT CCGAGAAGGT ACCATCAATG TCCACGACGT GGAGACACAG
1141 TTCAATCAGT ATAAAACGGA AGCAGCCTCT CGATAAACC TGACGATCTC AGACGTCAGC
1201 GTGAGTGATG TGCCATTTCC TTTCTCTGCC CAGTCTGGGG CTGGGGTGCC AGGCTGGGGC
1261 ATCGCGCTGC TGGTGCTGGT CTGTGTTCTG GTTGGCTGG CCATTGTCTA TCTCATTGCC
1321 TTGGCTGTCT GTCAGTGCCG CCGAAAGAAC TACGGGCAGC TGGACATCTT TCCAGCCCCG
1381 GATACCTACC ATCCTATGAG CGAGTACCCC ACCTACCACA CCCATGGGCG CTATGTGCCC
1441 CCTAGCAGTA CCGATCGTAG CCCCTATGAG AAGGTTCTG CAGGTAATGG TGGCAGCAGC
1501 CTCTCTTACA CAAACCCAGC AGTGGCAGCC ACTTCTGCCA ACTTGTAG

```

# FIGURE 7

SEQUENCE OF wMUC-1(6), SEQ. ID. NO: 1

MTPGTQSPFFLLLLLTVLTVVTGSGHASSTPGGEKETSATQRSSVPSSTEKNAV  
SMTSSVLSSHSPGSGSSTTQGQDVT LAPATEPASGSAALWGQDVTSVPVTRPAL  
GSTAPPAHGVTSAPDTRPAPGSTAPPAHGVTSAPDTRPAPGSTAPPAHGVTSAP  
DTRPAPGSTAPPAHGVTSAPDTRPAPGSTAPPAHGVTSAPDTRPAPGSTAPPAH  
GVTSAPDTRPAPASTLVHNGTSARATTPASKSTPFSIPSHHSDTPTTLASHST  
KTDASSTHHSTVPPLTSSNHSTSPQLSTGVSTFFLSFHISNLQFNSSLEDPSTD  
YYQELQORDISEMFLQIYKQGGFLGLSNIKFRPGSVVVQLTLAFREGTINVHDVE  
TOFNQYKTEAASRYNLTISDVSVDVPFPFSAQSGAGVPGWGIALLVLCVLVA  
LAIVYLIALLAVCQCRKNGYQLDIFPARDTYHPMSEYPTYHTHGRYVPPSSTDR  
SPYEKVSAGNGGSSLSYTNPAVAATSANL

# FIGURE 8

AMINO ACID SEQUENCE OF wMUC-1(6), SEQ. ID. NO: 2



```

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61 ACAGCCTCAC TTCTAACCTT CTGGAACCCG CCCACCACTG CCAAGCTCAC TATTGAATCC
121 ACGCCGTTCA ATGTCGCAGA GGGGAAGGAG GTGCTTCTAC TTGTCCACAA TCTGCCCCAG
181 CATCTTTTTG GCTACAGCTG GTACAAAGGT GAAAGAGTGG ATGGCAACCG TCAAATTATA
241 GGATATGTAA TAGGAAGTCA ACAAGCTACC CCAGGGCCCG CACAGAGTGG TCGAGAGATA
301 ATATACCCCA ATGCATCCCT GCTGATCCAG AACATCATCC AGAATGACAC AGGATTCTAC
361 ACCCTACACG TCATAAAGTC AGATCTTGTG AATGAAGAAG CAACTGGCCA GTTCGGGGTA
421 TACCCGGAAC TCCCTAAGCC TTCTATTAGC TCCAATAATA GTAAGCCTGT CGAAGACAAA
481 GATGCCGTCG CTTTTACATG CGAGCCCGAA ACTCAAGACG CAACATATCT CTGGTGGGTG
541 AACAAACAGT CCCTGCCTGT GTCCCCTAGA CTCCAACCTCA GCAACGGAAA TAGAACTCTG
601 ACCCTGTTTA ACGTGACCAG GAACGACACA GCAAGCTACA AATGCGAAAC CAAAAATCCA
661 GTCAGCGCCA GGAGGTCTGA TTCAGTGATT CTCAACGTGC TTTACGGACC CGATGCTCCT
721 ACAATCAGCC CTCTAAACAC AAGCTATAGA TCAGGGGAAA ATCTGAATCT GAGCTGTCAT
781 GCCGCTAGCA ATCCTCCCGC CCAATACAGC TGGTTTGTCA ATGGCACTTT CCAACAGTCC
841 ACCCAGGAAC TGTTCATTCC CAATATTACC GTGAACAATA GTGGATCCTA CACGTGCCAA
901 GCTCACAATA GCGACACCGG ACTCAACCGC ACAACCGTGA CGACGATTAC CGTGTATGAG
961 CCACCAAAAC CATTCATAAC TAGTAACAAT TCTAACCAGC TTGAGGATGA GGACGCAGTT
1021 GCATTAACCT GTGAGCCAGA GATTCAAAT ACCACTTATT TATGGTGGGT CAATAACCAA
1081 AGTTTGCCGG TTAGCCACG CTTGCAGTTG TCTAATGATA ACCGCACATT GACACTCCTG
1141 TCCGTTACTC GCAATGATGT AGGACCTTAT GAGTGTGGCA TTCAGAATGA ATTATCCGTT
1201 GATCACTCCG ACCCTGTTAT CCTTAATGTT TTGTATGGCC CAGACGACCC AACTATATCT
1261 CCATCATACA CCTACTACCG TCCCGGCGTG AACTTGAGCC TTTCTTGCCA TGCAGCATCC
1321 AACCCCCCTG CACAGTACTC CTGGCTGATT GATGGAAACA TTCAGCAGCA TACTCAAGAG
1381 TTATTTATAA GCAACATAAC TGAGAAGAAC AGCGGACTCT ATACTTGCCA GGCCAATAAC
1441 TCAGCCAGTG GTCACAGCAG GACTACAGTT AAAACAATAA CTGTTTCCGC GGAGCTGCCC
1501 AAGCCCTCCA TCTCCAGCAA CAACTCCAAA CCCGTGGAGG ACAAGGATGC TGTGGCCTTC
1561 ACCTGTGAAC CTGAGGCTCA GAACACAACC TACCTGTGGT GGGTAAATGG TCAGAGCCTC
1621 CCAGTCAGTC CCAGGCTGCA GCTGTCCAAT GGCAACAGGA CCCTCACTCT ATTCAATGTC
1681 ACAAGAAATG ACGCAAGAGC CTATGTATGT GGAATCCAGA ACTCAGTGAG TGCAAACCGC
1741 AGTGACCCAG TCACCCTGGA TGTCCTCTAT GGGCCGGACA CCCCATCAT TTCCCCCCTA
1801 GACTCGTCTT ACCTTTCGGG AGCGGACCTC AACCTCTCCT GCCACTCGGC CTCTAACCCA
1861 TCCCCGAGT ATTCTTGGCG TATCAATGGG ATACCGCAGC AACACACACA AGTTCTCTTT
1921 ATCGCCAAA TCACGCCAAA TAATAACGGG ACCTATGCCT GTTTTGTCTC TAACTTGGCT
1981 ACTGGCCGCA ATAATTCCAT AGTCAAGAGC ATCAGAGTCT CTGCATCTGG AACTTCTCCT
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2101 ATATAG

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## FIGURE 9

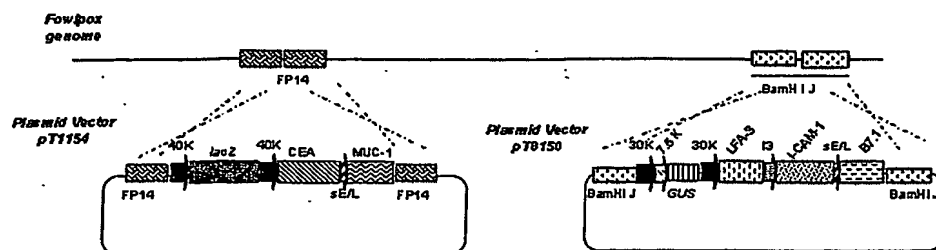
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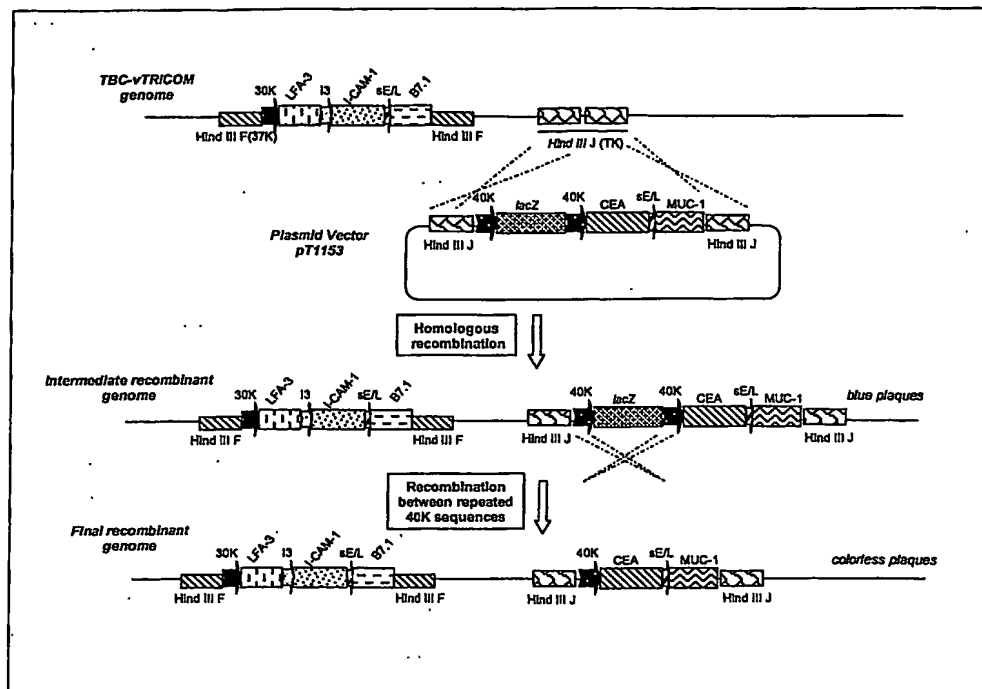
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gipqqhtqvlfiakitpnngtyacfvsnlatgrnnsivksitvsasgtspglsagatvg  
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**FIGURE 10**

**AMINO ACID SEQUENCE OF HUMAN wCEA(6D),  
SEQ. ID. NO: 4**

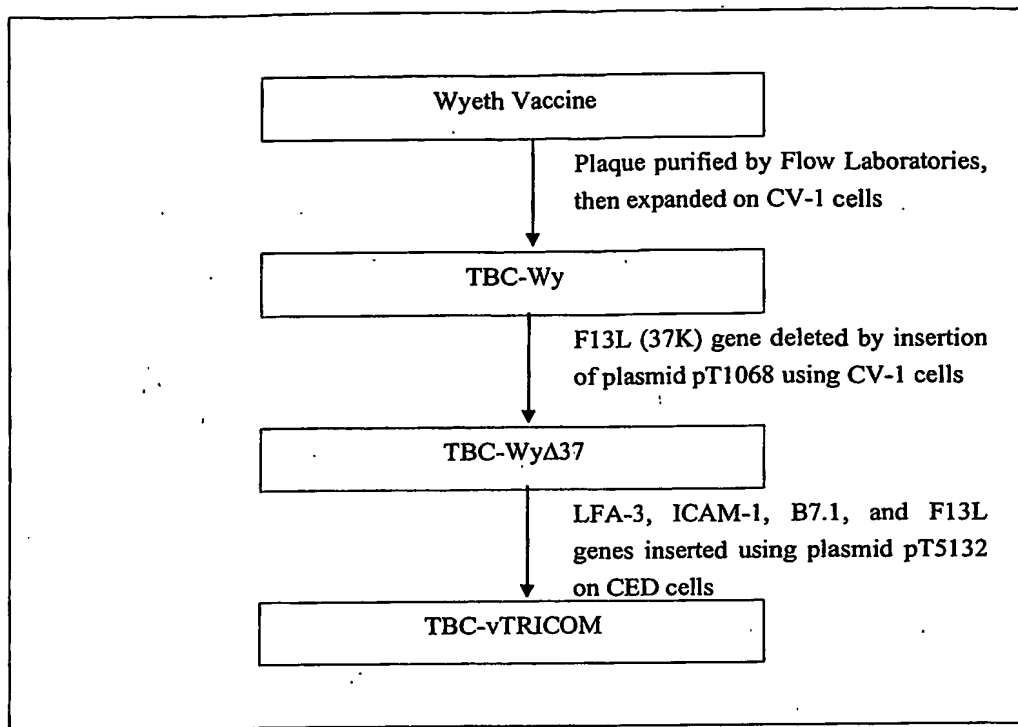
## PANVAC-F Plasmids pT1154 and pT8150

**FIGURE 11**



**FIGURE 12**  
**GENERATION OF PANVAC-V RECOMBINANT VACCINIA VIRUS**



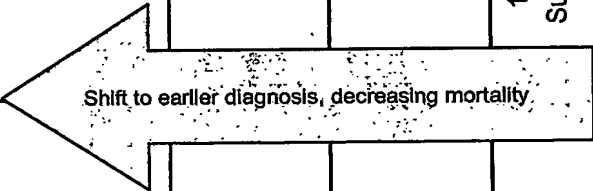


**Figure 14**

**Derivation of Parental Virus TBC-vTRICOM**

FIGURE 15: NEW BREAST CANCER CASES PROJECTED FOR 2004

Stage	%	New Cases	5-yr survival	Treatment Options
0	17%	36,965	100%	-Lumpectomy and radiation -Simple mastectomy
I	40%	86,976	98%	-Lumpectomy and radiation -Simple mastectomy -If >1cm adjuvant chemo or hormone therapy
II	31%	67,406	76-88%	-Surgery and adjuvant systematic therapy (radiation, chemo, tamoxifen)
III	6%	13,046	49-56%	-Surgery and adjuvant systematic therapy (radiation, chemo, tamoxifen) -Neoadjuvant chemotherapy before surgery
IV	3%	6,523	16% Median Survival 2.2 Yr.	-Systematic hormonal therapy and Cytotoxic chemotherapy -Immunotherapy with Herceptin -Palliative radiation or surgery
Stage Unknown	3%	6,523		



Shift to earlier diagnosis, decreasing mortality